Engineering Graphics and Design

Live session
Week 1-Tutorial 1
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The way of conveying the ideas through the systematic lines on the paper.
The art of representation of an object by systematic lines on a paper.

Engineering Drawing is artistic?
What is an engineering Drawing?
The art of representation of engineering objects.

Which is technical drawing, clearly defines and communicates a design to other interested clients.

‘ACTUAL DIMENSION \ ALWAYS’
Role of Graphics in design

- Visualization
- Communication
- Documentation
Objectives of an Engineering Drawing

- Easy to understand
- Neat and clear
- Complete specification
- Legible
- Correct
- Standards
Plane of projection

- First angle projection
- Third angle projection
- The object is placed between the observer and projection planes.

- The plane of projection is taken as solid in 1st angle projection?
The projection planes come between the object and observer.

The plane of projection is taken as transparent in 3rd angle projection.
First angle Projection
Third angle Projection
<table>
<thead>
<tr>
<th>Designation</th>
<th>Dimension (mm)</th>
<th>Pencil Type</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>A4</td>
<td>210 x 297</td>
<td>H</td>
<td>Visible outlines, visible edges, boundary lines</td>
</tr>
<tr>
<td>A3</td>
<td>297 x 420</td>
<td>HB</td>
<td>Border lines, lettering</td>
</tr>
<tr>
<td>A2</td>
<td>420 x 594</td>
<td>2H</td>
<td>Dimension lines, Leader lines, Projection lines, Extension lines, Centre lines, Hatching lines and Hidden lines</td>
</tr>
<tr>
<td>A1</td>
<td>594 x 841</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A0</td>
<td>841 x 1189</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Representation of Materials

<table>
<thead>
<tr>
<th>Type</th>
<th>Convention</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metals</td>
<td></td>
<td>Steel, Cast Iron, Copper and its Alloys, Aluminium and its Alloys, etc.</td>
</tr>
<tr>
<td>Glass</td>
<td></td>
<td>Lead, Zinc, Tin, White-metal, etc.</td>
</tr>
<tr>
<td>Packing and Insulating material</td>
<td></td>
<td>Glass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Porcelain, Stoneware, Marble, Slate, etc.</td>
</tr>
<tr>
<td>Liquids</td>
<td></td>
<td>Asbestos, Fibre, Felt, Synthetic resin products, Paper, Cork, Linoleum, Rubber, Leather, Wax, Insulating and Filling materials, etc.</td>
</tr>
<tr>
<td>Wood</td>
<td></td>
<td>Water, Oil, Petrol, Kerosene, etc.</td>
</tr>
<tr>
<td>Concrete</td>
<td></td>
<td>Wood, Plywood, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A mixture of Cement, Sand and Gravel</td>
</tr>
</tbody>
</table>
Visualization

Q1. Views?
Q2.

Views?

FV

X

LSV
Q3. Views?
Q4.

Views?

FV

TV
Q5

Views?

Front view

Top view

Right side view
Plane of symmetry

- An object having all axis of symmetry?
- Depict the axes of symmetry of
Q7

Isometric view

Orthographic
Q8. Depict the top view, side view and front view of the given object below. (Dimensioning is not required)
What is the difference between a Multiview drawing and an axonometric drawing?

An axonometric pictorial drawing for which the angle between each axis equals 120° and the scale used is full scale.
Parallel Lines of Sight Perpendicular to Picture Plane

(A) Multiview Projection

Parallel Lines of Sight Perpendicular to Picture Plane

(B) Axonometric Projection
(C) Oblique Projection

Parallel Lines of Sight Oblique to Picture Plane

(D) Perspective Projection

Lines of Sight Converge at the Observer's Eye (Station Point)

Observer at a Finite Distance from the Object
Applications

Example 1

![Image of a container ship](image-url)
Longitudinal sections of Ship’s Hull

Cutting edges of hull
Edges of sections
Transverse sections
Plane of symmetry

Left side view

Right side view
Horizontal sections
axis of symmetry
References/Textbooks

3. Technical Drawing with Engineering Graphics- by Frederick E Giesecke and Ivan L Hill